

CHM 2211L – Organic Chemistry Laboratory (2 credits)

Room 210 Scott Family Hall (SFH)

Spring 2024

Teaching Assistant	To be assigned
Faculty Coordinator	Dr. Tammy A. Davidson, davidson@chem.ufl.edu , Sisler 429B Please use Canvas or your official UF email for any correspondence
TA Office Hours	See Canvas site for schedule (http://elearning.ufl.edu)
Prerequisites	The prerequisite for CHM2211L is completion of either CHM2210 or CHM 2212 with a grade of C or higher, or completion of CHM3217. Please note that CHM2211L is intended to accompany either CHM 2211 or CHM2213, and we expect that you have a good working knowledge of the material covered in those lecture courses. Any students taking CHM2211L without concurrent registration in either CHM2211 or CHM2213 (or prior completion) should be prepared to do outside work as needed.
Course Delivery	This course will meet in-person in SFH 210 during your scheduled lab sessions. Occasional group work may occur via the Zoom platform. You will require a computer with an internet connection to upload assignments and to complete Knowledge Checks.
Course Objectives	The general objectives of this course are to introduce you to common laboratory techniques and equipment used in an organic chemistry laboratory, to help you gain understanding and proficiency in their use, to help you explore the process of doing organic chemistry, and to illustrate representative examples of the useful and important reactions you are learning in CHM 2211 lecture.

FIRST DAY OF LAB

The first lab session will be on **Wednesday, January 17** for students in sections that meet MW, on **Thursday, January 18** for students in sections that meet TR, and on **Friday, January 19** for students in sections that meet MF or WF. A full schedule for the semester is provided at the end of this syllabus, and the activities for each session are outlined in the Weekly Schedule pages in Module 3 in Canvas.

You must have the following items with you during your first lab session and each lab session thereafter:

- CHM2211L/2200L Lab Manual, 2023-2024 edition (Hayden-McNeil, available at UF bookstores)
- Department approved Safety Glasses/Goggles and proper laboratory attire

You must be wearing department approved safety glasses or goggles and be properly attired to be admitted to the laboratory at all times, even on the first day of lab. Students should wear loose fitting pants and a shirt (with sleeves) that covers the entire torso. There can be no exposed skin at the waist or ankle area. Please refer to the lab manual and the links on the Canvas site for more information on attire and the types of eye protection approved for use in this lab. **Anyone without the necessary materials (listed above), proper safety glasses/goggles, and appropriate clothing will not be allowed in the lab.**

During your first lab session, you will meet your TA and check into the lab. You will need to choose a PIN for the lock on your personal workstation drawer. Be careful and deliberate when entering the code to lock your drawer – you will need to use the same PIN to unlock your drawer the next time you come to lab, so be sure to enter the code carefully when you lock the drawer.

The Materials and Supplies fee that you pay for this course (\$87) covers all reagents/supplies and reasonable breakage/loss of glassware. You are responsible for maintaining all of the glassware and equipment in your personal workstation drawer for the entire semester. Check everything carefully during check-in to make sure all of your equipment is in good working order. Look for star and hairline cracks in your glassware, and check your separatory funnel carefully to make sure there are no leaks. Complete and sign the Safety Form and workstation equipment sheet (found in the “Forms” section of the Lab Manual), and turn them in at the stockroom window to complete the check-in process.

******NOTE: No students will be permitted to check into the lab after Week 4 (see schedule)******

GRADING

Your grade will be determined from two categories in this course. The first category focuses on the experimental work for the course, including pre-lab assignments, the data and observations recorded in your notebook while working in the lab, completion of post-lab summaries/questions, and successful completion of the experiments. The other portion of your grade will be determined by the lab practical and quizzes/exams that assess your understanding of the ideas covered in the course (both technical and the background chemistry), including laboratory safety and various concepts/techniques from the laboratory experiments. Although it is natural to worry about grades, please don't let it become an obsession that ruins your experience in the lab. The course is designed so that the average grade is at least B+, and any student who completes all of the assignments in the class will earn at least a C.

Grades will be determined from the following factors and weighted as indicated:

<u>Experimental Work</u>		<u>Assessment of Understanding</u>	
Pre-Labs	5%	Safety/Policy Quiz	5%
Lab Notebook/Summaries	15%	Knowledge Checks	15%
Experiment Completion	10%	Lab Practical	25%
		Lab Exam	25%

The grading scale will be firmly set as follows: A ≥ 89.5%, A- = 86.5-89.4%, B+ = 83.5-86.4%, B = 76.5-83.4%, B- = 72.5-76.4%, C+ = 69.5-72.4%, C = 61.5-69.4%, C- = 58.5-61.4%, D+ = 54.5-58.4%, D = 50-55.4%, E < 50.0%. There will not be a curve beyond that already included in the scale above, and there is no rounding of scores in Canvas. UF grading policies are at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

Explanation of Grade Breakdown:

The **Pre-Lab (PL)** grade consists of your Pre-Lab Assignments which are found in the lab manual for each experiment and are graded on a 5 point scale. See schedule for due dates. Upload a PDF scan of your pre-lab to the Assignments section of Canvas by 8:00am on the day of your lab session. **Anyone who has not submitted a pre-lab may not do the lab that day.**

Lab Notebook/Summaries (NB) are the notes you take during lab and your answers to the post-lab questions from the lab manual, and will be graded on a 10 point scale. Upload a PDF scan of the duplicate pages from your notebook to the Assignments section of Canvas. Your score on the online **Spectroscopy Module Quiz** will also count as a notebook grade. See the schedule for specific due dates.

Various assessments that demonstrate your understanding of the course material are dispersed throughout the semester – see the schedule for specific dates. An online **Safety/Policy Quiz** will be available on Canvas under the Quizzes tab. The **Lab Practical** will assess your ability to determine a melting point range for an unknown compound accurately and your ability to carry out a synthesis and recrystallization using a procedure that was performed earlier in the semester. More details will be given as the practical date approaches. Four periodic **Knowledge Checks** to gauge understanding will be given in Canvas. The **Lab Exam** will held in-person, on campus during an evening assembly exam slot and will evaluate your cumulative knowledge of the concepts/techniques covered in the lab. *****Note: The online safety quiz must be completed on the Canvas site by 11:00pm on Friday, January 26.*****

The Organic Teaching Laboratory is a hands-on learning environment. You are expected to be on time for lab and ready to complete the experiment scheduled for that session. A portion of your grade will come from successful **Experiment Completion**. Time is built into the schedule to allow for an occasional absence.

LAB CLEANLINESS AND LATE PENALTIES

You are expected to attend your scheduled lab session, complete the planned activity, clean up your work area, and leave the lab when your lab period ends. Everyone in this course is given the same amount of time to complete the experiments. If you are well prepared, you should have no problem finishing the experiments within the allotted time. **You may not stay late or come in during another lab section to do your experiments.**

You will find a weekly schedule in Module 3 in Canvas and at the end of this syllabus that shows this semester's experiments, along with the due dates for assignments. The following late penalties will be assessed as needed:

Late leaving the lab or leaving a messy workstation.....1 point deduction from Notebook grade per occurrence
Any assignment turned in late.....10% deduction on item for each day late

GRADING DISPUTES AND REQUESTS FOR REGRADES

Pre-Lab and Notebook assignments are graded by your TA using rubrics provided in Canvas. You should address any grading disputes on these items directly with your TA no later than one week after your TA posts the score on graded items in Canvas. Any grading disputes on Knowledge Checks must be addressed via email to the course instructor within one week of the score being posted in the gradebook.

The Lab Practical is graded immediately after submission using the same grading rubric for all samples, which ensures consistent evaluation of sample mass and crystal quality. Regrade requests for the Lab Practical must be submitted on a regrade request form (available at the lab stockroom) within one week of the date on which the papers are returned in the lab.

The Lab Exam will be a multiple choice Scantron assessment and must be completed using a pencil. Bubbling errors will not be negotiated. Additionally, a 5% penalty will be applied for any issues that require manual grading of the exam, including but not limited to failure to provide a correct UF ID number, a missing or incorrect form code, or filling out the Scantron with pen. Any grading disputes must be presented within one week of the date on which the scores are posted in Canvas.

Requests for re-grades will not be accepted after the deadline has passed. Please note that the purpose of regrading is to make sure all assessments are graded according to the same standard – it is not a means to negotiate for more points. To ensure fairness, the entire assignment will be regraded based on the grading rubric, and grades may go up or down with the regrade. **All re-grade decisions are final.**

COURSE COMMUNICATION POLICY

We will use the Announcements page in Canvas to post information that is relevant to the class as a whole. Please be sure to check the Canvas announcements regularly for updates. If you need to contact your TA or the faculty coordinator, please use the Canvas email tool or your official UF email (there is no need to send duplicate messages from both). We cannot discuss grading or any other course related issues via external email. We will do our best to respond to emails within 24 hours during the work week (Monday-Friday). You should not expect a reply to any email sent after 5pm or over the weekend (or on a holiday) until the next business day.

All students are expected to treat their classmates and instructors with respect, both in the classroom and when communicating via Canvas or email.

ATTENDANCE

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the Undergraduate Catalog at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

This is a hands-on course, and regular attendance and participation is critical to your understanding and overall success. Each laboratory session, you will learn techniques and concepts that will continue to be important throughout the semester. Please note that due to time and space constraints, students can only attend their regularly scheduled lab sessions – **you may not come in during a different lab period to do any experiments.** It is essential that you arrive on time and prepared for the activity each time that lab meets. **If you are more than 15 minutes late, you may not be allowed to enter the lab.** If you have an issue that will cause you to be routinely late to the lab, you need to discuss that with your TA and Dr. Davidson.

Students are **expected to complete all the scheduled experiments during the semester.** Each experiment has been designed to be able to be completed within the allotted time. We have included extra time within the schedule to allow for an occasional absence. If you miss a lab session, you will simply continue with the activity during the next session. The schedule at the end of this syllabus and in Module 3 in Canvas indicates the first day that an experiment begins and the last day to complete an experiment.

Important: If you need to miss an entire experiment due to extreme circumstances that are beyond your control (i.e., serious illness, death in the family, University sponsored travel, etc.), you must submit a Request for

Excused Absence on the Canvas site **no later than one week after the missed experiment**. You will need to provide documentation (a doctor's note, University excuse, funeral program, etc.) in order to have your request considered. You are still responsible for any course content that is missed. Please understand that personal issues with scheduling conflicts, such as work, non-emergency dentist or doctor appointments, extracurricular activities, family vacations, etc., do not justify an excused absence from lab.

Please note: If you miss a Knowledge Check, the Lab Practical, or the Lab Exam, you must contact Dr. Davidson via email within 24 hours of missing the assessment to request a make-up.

PRE-LAB ASSIGNMENTS AND LABORATORY NOTEBOOK/SUMMARIES

Before you come to your lab session, carefully read through the scheduled experiment and complete your Pre-Lab Assignment (the colored sheet found after each experiment in the lab manual). These Pre-Lab Assignments are designed to ask you to think about the lab procedure to be performed, understand how it relates to other aspects of chemistry, and guide you in your preparation for the experiment. You may need to refer to your lecture text to help you answer some of the questions. Don't wait until just before lab to get prepared – instead, work on your Pre-Lab ahead of time so you can ask your TA for help if you are confused about anything. **Turn your pre-lab assignment via upload to Canvas by 8:00am on the day of your in-person lab session.** You will find that the labs will go much smoother if you have read through everything ahead of time, so be sure to do a good job in getting organized.

Your laboratory notebook should be an accurate, legible, permanent record of everything that you do in the laboratory. Use the carbonless duplicate sets at the back of your manual, and start each new experiment on a fresh page. Include the title of the experiment, the chemical reaction that is being performed (if applicable), any physical data that is needed in the experiment (such as molar masses, melting points, boiling points, and densities), and any important safety alerts. While you are conducting an experiment, write everything in your notebook. Record your activities (a brief procedure – does not need to be complete sentences) and all data (weights, volumes, reaction times, melting or boiling points, calculations, etc.) and observations (colors, textures, odors, visual indications of reaction, etc.) directly into your notebook as you do your experiment. When you have finished the experiment, you should include a brief summary of your results and make any conclusions that can be drawn from your data. Also, be sure to answer the post-lab questions in your notebook. You will turn in scanned copies of the duplicate pages from your notebook via Canvas upload.

Be sure to consider the following items when preparing your notebook:

- The notebook must be kept in non-erasable, waterproof ink (preferably ballpoint)
- All errors must be crossed out with a single line – no scribbles or white-out!
- Do not skip or tear out pages – cross out with an X if the entire page is incorrect
- Experiments must have titles and include the dates that they are performed
- Include the names of your teammates (if applicable)
- There should be enough detail so that someone with a reasonable understanding of organic chemistry (like your TA) could repeat your work using only your notebook
- Accuracy and truth are more important than a “pristine” entry
- All entries must be made while the experiment is conducted and the duplicate pages must be turned in to the TA for grading after completion of the experiment – see the schedule for due dates

Grading rubrics for the Pre-Labs and Notebooks are provided on Canvas.

A NOTE ON TEAMWORK AND PARTICIPATION

Teamwork is an integral component of doing science. In today's world, researchers depend on collaboration with their colleagues to share ideas, spark creativity, maximize strengths, troubleshoot problems, and share limited resources. The days of lone scientists toiling away in lab by themselves are over. Teaching labs are no exception. The organic lab is an ideal place to exemplify the benefits of working together towards a common goal. Teamwork allows us to explore more sophisticated chemistry and develop a deeper understanding of what is happening in our experiments through active discussion.

You will see that many of our experiments will have activities done in small teams. The goal of this approach is that everyone participates equally in the process, and that can only happen if you are prepared when you come to class.

ASSEMBLY EXAM CONFLICTS

Some students enrolled in evening laboratory sections may experience conflicts with their scheduled laboratory session and assembly exams in other courses. The official timeslot for assembly exams during the fall/spring term is for periods E2-E3 (8:20-10:10 pm)**. You are expected to attend your organic lab until 8:00 pm on the evening of an assembly exam. (Many times, you may be able to finish what you need to do that day without any trouble.) Please let your TA know if you have an assembly exam coming up so he or she can assist you with planning your activities in the lab. The lab instructors for the evening sessions will discuss this further with you during check-in day. Please do not complete a request for excused absence for an assembly exam given periods E2-E3.

**Any other exams that are scheduled for outside of their normal class time, but not in an official assembly exam block, are not considered to be assembly exams by the university. We are not required to accommodate test conflicts if they are not official assembly exams as scheduled through the registrar's office. Please discuss makeup exam options with your instructor in the other course before requesting accommodation for this lab.

ACADEMIC HONESTY GUIDELINES

The University of Florida holds its students to the highest standards, and we encourage students to read the University of Florida Student Honor Code and Student Conduct Code (Regulation 4.040), so they are aware of our standards. Any violation of the Student Honor Code will result in a referral to Student Conduct and Conflict Resolution and may result in academic sanctions and further student conduct action. The two greatest threats to the academic integrity of the University of Florida are cheating and plagiarism. Students should be aware of their faculty's policy on collaboration, should understand how to properly cite sources, and should not give nor receive an improper academic advantage in any manner through any medium. You can find more information about UF's Academic Honesty Policy from the Dean of Students Office website at <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.

INFORMATION FOR STUDENTS WITH DISABILITIES

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <http://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester. Note that DRC accommodations cannot be applied retroactively.

EVALUATIONS

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

THE SCHEDULE FOR THE SEMESTER CAN BE FOUND ON THE FOLLOWING PAGES.

SCHEDULE OF ACTIVITIES – CHM2211L – SPRING 2024[†]

Week	Dates	Activity
1	1/8 – 1/12	No lab sessions this week due to drop/add. You should use this time to read over the syllabus, familiarize yourself with the Canvas site, and review the content in the Safety and Laboratory Procedures module in Canvas. The online Safety/Policy Quiz will be available beginning January 10.
2	1/15 – 1/17a ^s	***Dr. Martin Luther King, Jr. Day Holiday – no labs (all sections) on Monday, Tuesday, or the Wednesday 8:30am sessions.***
	1/17p ^s – 1/19	Check-in (read pgs. v-xv and Chapter 1 in manual and watch Check-In Day videos in Modules on Canvas before lab) <i>Chapter 2: Introduction to Melting Point</i> – view video in Modules area before lab
3	1/22 – 1/24a	<i>Chapter 4: Synthesis of Acetophenetidin, Part 1</i>
		<i>Items Due:</i> <ul style="list-style-type: none"> • Acetophenetidin Pre-Lab (PL) – upload to Canvas by 8:00am on the day of your lab session
	1/24p – 1/26	<i>Chapter 4: Synthesis of Acetophenetidin, cont., Parts 3 and 4 (omit part 2)</i>
		<i>Items Due:</i> <ul style="list-style-type: none"> • Safety/Policy Quiz due on Friday, January 26 by 11:00pm
4	1/29 – 1/31a	<i>Chapter 3: Identification of Organic Compounds using Spectroscopy</i> (view Spectroscopy module on Canvas before coming to lab)
		<i>Items Due:</i> <ul style="list-style-type: none"> • Spectroscopy PL – upload to Canvas by 8:00am on the day of your lab session
	1/31p – 2/2	Last day to finish <i>Chapter 4: Synthesis of Acetophenetin</i> and <i>Chapter 3: Identification of Organic Compounds using Spectroscopy</i> If you have completed both activities, you do not need to attend this session
<i>Items Due:</i> <ul style="list-style-type: none"> • Knowledge Check 1 – opens at 5pm on 2/1, due by 11:00pm on 2/2 		
****No students will be permitted to check in after Week 4****		

Week	Dates	Activity
5	2/5 – 2/7a	Chapter 5: Extraction, Parts 2 and 3 – watch dye extraction demo videos in Modules area prior to coming to lab
		<i>Items Due:</i> <ul style="list-style-type: none"> Extraction PL – upload to Canvas by 8:00am on the day of your lab session
	2/7p – 2/9	Chapter 5: Extraction, cont., Parts 4 and 5
		<i>Items Due:</i> <ul style="list-style-type: none"> Acetophenetidin Notebook (NB) due by 11pm on Sunday Online Spectroscopy Module quiz due 2/9 at 11:00pm (counts as a NB grade)
6	2/12 – 2/14a	Chapter 9: Extraction and TLC of Pigments in Spinach Last day to finish Chapter 5: Extraction
		<i>Items Due:</i> <ul style="list-style-type: none"> Spinach PL – upload to Canvas by 8:00am on the day of your lab session
	2/14p – 2/16	Last day to finish Chapter 9: Extraction and TLC of Pigments in Spinach If you have completed this activity, you do not need to attend this session
		<i>Items Due:</i> <ul style="list-style-type: none"> EAS PL – upload to Canvas by 8:00am on the day of your lab session Extraction NB due by 11pm on Sunday Knowledge Check 2 – opens at 5pm on 2/15, due by 11:00pm on 2/16
7	2/19 – 2/21a	Chapter 8: Electrophilic Aromatic Substitution (EAS)
	2/21p – 2/23	Chapter 6: Synthesis and Testing of Biodiesel, day 1 Last day to finish Chapter 8: EAS
		<i>Items Due:</i> <ul style="list-style-type: none"> Spinach NB due by 11pm on Sunday

Week	Dates	Activity
8	2/26 – 2/28a	Chapter 6: Synthesis and Testing of Biodiesel, day 2 Clean glassware for Lab Practical
		Items Due: <ul style="list-style-type: none"> • Biodiesel PL – upload to Canvas by 8:00am on the day of your lab session
	2/28p – 3/1	Last day to finish Chapter 6: Synthesis and Testing of Biodiesel, day 2, and Clean glassware for Lab Practical If you have completed these activities, you do not need to attend this session
		Items Due: <ul style="list-style-type: none"> • Knowledge Check 3 – opens at 5pm on 2/29, due by 11:00pm on 3/1 • EAS NB due by 11pm on Sunday
9	3/4 – 3/6a	Lab Practical
	3/6p – 3/8	Lab Practical (if additional time is needed). Students who finish the practical during Lab Session 1 do not need to attend this session.
		Items Due: <ul style="list-style-type: none"> • Biodiesel NB due by 11pm on Sunday
10	3/11 – 3/15	***No lab sessions this week (Spring Break)***
11	3/18 – 3/20a	Chapter 10: Acetylation of Ferrocene, parts 1 and 2
		Items Due: <ul style="list-style-type: none"> • Ferrocene PL – upload to Canvas by 8:00am on the day of your lab session
	3/20p – 3/22	Chapter 10: Acetylation of Ferrocene, parts 3 and 4
12	3/25 – 3/27a	Chapter 12: Making Polymers, Parts 2 and 3 Chapter 13: Renewable Block Copolymers, Part 1 Last day to finish Chapter 10: Acetylation of Ferrocene
		Items Due: <ul style="list-style-type: none"> • Polymers PL – upload to Canvas by 8:00am on the day of your lab session
	3/27p – 3/29	Chapter 13: Renewable Block Copolymers, Part 2 Last day to finish Chapter 12: Making Polymers
		Items Due: <ul style="list-style-type: none"> • Ferrocene NB due by 11pm on Sunday

Week	Dates	Activity
13	4/1 – 4/3a	<i>Chapter 13: Renewable Block Copolymers, Part 3</i>
	4/3p – 4/5	<i>Chapter 7: Synthesis of Fluorescent Coumarin Derivatives, Parts 1 and 2</i> Last day to finish <i>Chapter 13: Renewable Block Copolymers</i>
		<i>Items Due:</i>
14	4/8 – 4/10a	<i>Chapter 14: Dyes and Dyeing and Check Out</i> Last day to finish <i>Chapter 7: Coumarins</i>
		<i>Items Due:</i>
	4/10p – 4/12	Last day to finish <i>Chapter 14: Dyes and Dyeing and Check Out</i> If you have completed these activities, you do not need to attend this session
		<i>Items Due:</i>
15	4/15 – 4/19	Lab Exam – Wednesday, April 17 at 8:20pm. See Canvas site for room locations.
		<i>Items Due:</i>
16	4/22-4/24	No course activities scheduled this week.

†Schedule may change due to unforeseen events – see course Canvas site for any updates.

§NOTE: An “a” indicates labs beginning at 8:30am on Wednesdays, while the “p” indicates labs beginning at 11:45am or later on Wednesdays.